

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) A method of making a loop fastener product, the method comprising placing a layer of fibers against a first side of a carrier sheet of film, the layer of fibers having an overall density of less than about 5 ounces per square yard and the film having an overall thickness of less than about 0.005 inch;

needling fibers of the layer through the film by piercing the film with needles that drag portions of the fibers through holes formed in the film during needling, leaving loops of the fibers extending from the holes on a second side of the carrier sheet, the needling comprising at least 100 piercings per square centimeter;

placing a binder on the fibers on the first side of the pierced film; and
fusing the binder to the film to anchor bases of the loops.

2. (Original) The method of claim 1 wherein the needles pierce the film to a needling density of at least 200 piercings per square centimeter. \

3. (Cancelled)

4. (Original) The method of claim 1 wherein the fiber density is less than about 3 ounces per square yard (100 grams per square meter).

5. (Cancelled)

6. (Original) The method of claim 1 wherein the film has a nominal thickness of less than about 0.003 inch (0.08 millimeter).

7-8. (Cancelled)

9. (Original) The method of claim 1 wherein the film forms projections extending out of a general plane of the film at the holes, the projections bearing against fibers passing through the holes.

10. (Original) The method of claim 1 wherein the fibers have an average staple length less than about 6 inches (15 centimeters).

11-14. (Cancelled)

15. (Original) The method of claim 1 wherein the fibers have a nominal tenacity of at least 3.0 grams per denier.

16. (Original) The method of claim 1 wherein the fibers are of between about 2 and 10 denier.

17-21. (Cancelled)

22. (Original) The method of claim 1 wherein the film is pre-printed with graphics that remain visible from the second side of the carrier sheet after fusing.

23. (Original) The method of claim 1 further comprising embossing the second side of the carrier sheet, after fusing, to impart a desired pattern to the loops.

24. (Original) The method of claim 23 wherein the pattern comprises raised beds of loops surrounded by regions of crushed fibers.

25. (Original) The method of claim 1 wherein the carrier sheet, fibers and binder all consist essentially of a single recyclable base resin.

26-28. (Cancelled)

29. (Original) The method of claim 1 wherein the needles are of 25 gauge or smaller diameter.

30. (Cancelled)

31. (Original) The method of claim 1 wherein the needles are forked.

32. (Original) The method of claim 1 wherein the needles pierce the carrier sheet from the first side of the carrier sheet.

33. (Original) The method of claim 1 wherein the needles penetrate the carrier sheet to a penetration distance of between about 2 and 8 millimeters, measured from an entrance side of the sheet.

34. (Cancelled)

35. (Original) The method of claim 1 wherein needling density and penetration distances are selected to provide a textured pattern to the loops.

36. (Original) The method of claim 1 wherein the carrier sheet is needled only in selected regions, with other regions of the carrier sheet not needled, to form loops only in the selected regions.

37. (Original) The method of claim 36 wherein more fibers are placed against the carrier sheet of film in the selected regions than in the other regions.

38. (Original) The method of claim 36 further comprising, after needling, removing fibers from the other regions.

39. (Original) The method of claim 36 wherein the binder is applied only to the selected regions of the carrier sheet.

40. (Original) The method of claim 1 wherein the binder comprises a second sheet of film.

41. (Original) The method of claim 40 wherein the binder is pre-printed with graphics that remain visible from the second side of the carrier sheet after fusing.

42. (Original) The method of claim 40 wherein the second sheet of film comprises a resin more weld-compatible than resin of the fibers with resin of the carrier sheet.

43. (Original) The method of claim 40 wherein the second sheet of film has a nominal thickness of less than about 0.003 inch (0.08 millimeter).

44. (Cancelled)

45. (Original) The method of claim 40 further comprising preheating the second sheet of film before placing the second sheet of film on the fibers.

46. (Original) The method of claim 1 wherein the loop fastener product, including carrier sheet, fibers and fused binder, has an overall weight of less than about 15 ounces per square yard (500 grams per square meter).

47-48. (Cancelled)

49. (Original) The method of claim 1 wherein the fastener product, including carrier sheet, loops and fused binder, has an overall thickness of less than about 0.1 inch (2.5 millimeters).

50-53. (Cancelled)

54. (Original) The method of claim 1 wherein the carrier sheet comprises a stretchable resin film.

55. (Original) The method of claim 54 wherein the carrier sheet is needled in a stretched state and then relaxed to densify the loops.

56. (Original) The method of claim 54 wherein the binder comprises a second sheet of stretchable resin film.

57. (Original) The method of claim 1 wherein the binder is in powder form.

58. (Original) The method of claim 1 wherein the needling sufficiently perforates the film that the carrier sheet becomes distendable; and wherein the binder comprises a stretchable material, thereby forming a stretchable loop fastener product.

59. (Cancelled)

60. (Original) The method of claim 58 wherein, after needling and before fusing, material of the carrier sheet forms generally discrete regions separated by cracks extending between holes punched through the carrier sheet by the needling. (Original)

61. (Original) A method of making a loop fastener product, the method comprising placing a layer of fibers against a first side of a carrier sheet;
needling fibers of the layer through the carrier sheet by piercing the sheet with needles that drag portions of the fibers through holes formed in the sheet during needling, leaving loops of the fibers extending from the holes on a second side of the carrier sheet;
placing a particulate-form binder on the fibers on the first side of the pierced sheet, particles of the binder entering interstices defined between adjacent fibers near the holes in the carrier sheet; and then
fusing the binder to the carrier sheet to anchor bases of the loops.

62. (Original) The method of claim 61 wherein the binder is in the form of a dry powder.

63. (Original) The method of claim 61 wherein the binder has a nominal particulate size of less than about 20 microns.

64. (Cancelled)

65. (Original) The method of claim 61 wherein the carrier sheet is a resin film.

66. (Original) The method of claim 61 wherein the carrier sheet comprises paper.

67. (Original) The method of claim 61 wherein the carrier sheet comprises a non-woven, woven or knit material.

68-69. (Cancelled)

70. (Original) The method of claim 61 wherein the binder is placed on the pierced sheet in a distribution of less than about two ounces per square yard (66 grams per square meter).

71-76. (Cancelled)

77. (Original) The method of claim 61 wherein fusing the binder comprises applying heat and pressure to the first side of the pierced sheet.

78. (Original) The method of claim 77 wherein the pressure is applied by a rotating roller.

79. (Original) The method of claim 77 wherein the pressure is applied by a flatbed laminator.

80. (Original) A method of making a loop fastener product, the method comprising placing a layer of fibers against a first side of a carrier sheet;
with a second side of the carrier sheet against a support bed, needling fibers of the layer through the carrier sheet by piercing the sheet with needles that drag portions of the fibers through holes formed in the sheet during needling, leaving loops of the fibers extending from the holes into the support bed on a second side of the carrier sheet;

placing a binder on the fibers on the first side of the pierced sheet; and,
with the loops extending into the support bed, applying pressure to the first side of the pierced sheet to fuse the binder to the carrier sheet in regions supported by the support bed.

81. (Original) The method of claim 80 wherein the support bed comprises a bed of pins, distal ends of the pins contacting the second side of the carrier sheet and the loops extending between adjacent pins.

82. (Original) The method of claim 81 wherein the pins are arranged with a pin density of at least about 150 pins per square inch (23 pins per square centimeter).

83-86. (Cancelled)

87. (Original) The method of claim 80 wherein the support bed comprises a stitching plate defining holes aligned with the needles.

88. (Original) The method of claim 80 wherein the pressure is applied by a heated surface placed against the binder on the first side of the carrier sheet.

89. (Original) The method of claim 88 wherein the heated surface is a peripheral surface of a rotating roller.

90. (Original) The method of claim 88 wherein the heated surface is maintained at a temperature high enough, and is held against the binder long enough, to cause the binder to melt in the regions supported by the support bed, without significantly melting resin of the fibers.

91. (Original) The method of claim 80 wherein the support bed comprises a screen, the screen contacting the second side of the carrier sheet and the loops extending through openings in the screen.

92. (Original) The method of claim 91 wherein the screen comprises wire defining the openings.

93. (Original) The method of claim 92 wherein the screen comprises wire of a nominal diameter of between about 0.02 and 0.03 inch (0.5 and 0.8 millimeter).

94-96. (Cancelled)

97. (Original) The method of claim 91 wherein the openings have a nominal width of between about 0.05 and 0.2 inch (1.3 and 5.1 millimeter).

98. (Cancelled)

99. (Original) The method of claim 91 wherein the pressure is applied by a heated surface placed against the binder on the first side of the carrier sheet.

100. (Original) The method of claim 99 wherein the heated surface is a peripheral surface of a rotating roller.

101. (Original) The method of claim 99 wherein the heated surface is maintained at a temperature high enough, and is held against the binder long enough, to cause the binder to melt in the regions supported by the support bed, without significantly melting resin of the fibers.

102. (Original)A method of making a stretchable loop fastener product, the method comprising

placing a layer of fibers against a first side of a carrier sheet;

needling fibers of the layer through the carrier sheet by piercing the sheet with needles that drag portions of the fibers through holes formed in the sheet during needling, leaving loops of the fibers extending from the holes on a second side of the carrier sheet, the needling sufficiently perforating the carrier sheet that the carrier sheet becomes distendable;

placing a stretchable material on the fibers on the first side of the pierced sheet; and
fusing the stretchable material to the carrier sheet to anchor bases of the loops.

103. (Original)The method of claim 102 wherein the stretchable material comprises a stretchable resin film.

104. (Original)The method of claim 102 wherein the carrier sheet comprises a resin film.

105. (Original)The method of claim 104 wherein the film has a nominal thickness of less than about 0.003 inch (0.08 millimeter).

106. The method of claim 102 wherein, after needling and before fusing, material of the carrier sheet forms generally discrete regions separated by cracks extending between holes punched through the carrier sheet by the needling.

107. (Original)The method of claim 102 wherein the needles pierce the film to a needling density of at least 250 piercings per square centimeter.

108. (Original)The method of claim 102 wherein the needles are of a diameter of at least about 0.03 inch (0.75 millimeter).

109. (Original)The method of claim 102 wherein the fiber density is less than about 2 ounces per square yard (66 grams per square meter).

110. (Original)A method of making a lightweight loop fastener product, the method comprising

placing a layer of fibers against a first side of a carrier sheet, the fibers being of between about 2 and 10 denier;

needling fibers of the layer through the carrier sheet by piercing the sheet with needles that drag portions of the fibers through holes formed in the sheet during needling, leaving loops of the fibers extending from the holes on a second side of the carrier sheet, the needles penetrating to a maximum distance of less than about 7.0 millimeters from the first side of the carrier sheet and being of a diameter of less than about 0.036 inch (0.9 millimeter);

placing a binder on the fibers on the first side of the pierced sheet; and

fusing the binder to the carrier sheet to anchor bases of the loops.

111. (Original)The method of claim 110 wherein the needles pierce the film to a needling density of at least 200 piercings per square centimeter.

112. (Original)The method of claim 110 wherein the fibers have an overall density of less than about 3 ounces per square yard (100 grams per square meter).

113. (Original)The method of claim 112 wherein the overall fiber density is less than about 1.5 ounces per square yard (66 grams per square meter).

114. (Original)The method of claim 110 wherein the carrier sheet has a nominal thickness of less than about 0.003 inch (0.08 millimeter).

115. (Original)The method of claim 114 wherein the nominal thickness is less than about 0.002 inch (0.05 millimeter).

116. (Cancelled)

117. (Original)The method of claim 116 wherein the film forms projections extending out of a general plane of the film at the holes, the projections bearing against fibers passing through the holes.

118-121. (Cancelled)

122. (Original)The method of claim 110 wherein the fibers have a nominal tenacity of at least 3.0 grams per denier.

123. (Original)The method of claim 110 wherein the fibers are of between about 3 and 6 denier.

124. (Original)The method of claim 110 wherein the needles penetrate to a maximum distance of between about 3 and 4 millimeters from the first side of the carrier sheet.

125. (Original)The method of claim 110 wherein the binder comprises a sheet of film.

126. (Original)The method of claim 125 wherein the binder is pre-printed with graphics that remain visible from the second side of the carrier sheet after fusing.

127. (Cancelled)

128. (Original)The method of claim 125 wherein the sheet of film has an overall thickness of less than about 0.003 inch (0.08 millimeter).

129. (Cancelled)

130. (Original)The method of claim 125 further comprising preheating the sheet of film before placing the binder on the fibers.

131. (Original)The method of claim 110 wherein the loop fastener product, including carrier sheet, fibers and fused binder, has an overall weight of less than about 15 ounces per square yard (500 grams per square meter).

132. (Original)The method of claim 110 wherein the fastener product, including carrier sheet, loops and fused binder, has an overall thickness of less than about 0.1 inch (2.5 millimeters).

133. (Original)The method of claim 110 wherein the fused binder and carrier sheet together form a base sheet of the fastener product from which the loops extend, the base sheet having an overall thickness of less than about 0.005 inch (0.13 millimeter).

134. (Original)A method of providing hook-engageable loops in selected regions on a carrier sheet, the method comprising

placing a layer of fibers against a first side of a carrier sheet;

needling fibers of the layer through the carrier sheet in selected regions by piercing the sheet with needles that drag portions of the fibers through holes formed in the selected regions of the sheet during needling, leaving loops of the fibers extending from the holes on a second side of the carrier sheet;

placing a binder on the fibers on the first side of the pierced sheet in the selected regions;
and
fusing the binder to the carrier sheet to anchor bases of the loops.

135. (Original)The method of claim 134 wherein the binder is in the form of a liquid-impermeable sheet that covers the fibers and holes to form a barrier to liquid passing through the holes formed in the carrier sheet by the needling.

136. (Original)The method of claim 135 wherein the liquid-impermeable sheet is in the form of discrete sheet portions placed against the selected regions, with the other regions not covered by the binder.

137. (Original)The method of claim 135 wherein the binder is pre-printed with graphics that remain visible from the second side of the carrier sheet after fusing.

138. (Original)The method of claim 134 wherein the binder has an overall thickness of less than about 0.003 inch (0.08 millimeter).

139. (Original)The method of claim 134 wherein the binder is in the form of a dry powder.

140. (Original)The method of claim 134 wherein the binder is in liquid form.

141. (Original)The method of claim 134 wherein the carrier sheet is needled while a second side of the carrier sheet against a support bed, and wherein the binder is placed on the carrier sheet with the loops extending from the holes into the support bed.

142. (Original)The method of claim 134 further comprising, after fusing, severing the carrier sheet to form discrete sheet products, each sheet product having at least one region with loops and another region free of loops.

143. (Original)The method of claim 142 further comprising forming the discrete sheet portions into outer layers of disposable garments, the region with loops arranged to be releasably engaged by male touch fastener elements for securing the garment about a wearer.

144. (Original)The method of claim 143 wherein the disposable garment comprises a diaper.

145-155. (Cancelled)

156. (Original)A loop fastener product, the product comprising:
a carrier sheet of film having an overall thickness of less than about 0.005 inch (0.1 millimeter) and defining at least 100 piercing holes therethrough per square centimeter;
a layer of fibers disposed on a first side of the carrier sheet of film, the layer of fibers having an overall density of less than about 5 ounces per square yard, loops of the fibers extending from the holes on a second side of the carrier sheet, and
a binder fused to the film to anchor bases of the loops on the first side of the pierced film.

157. (Original)The product of claim 156 wherein the film defines at least 200 piercing holes per square centimeter.

158. (Cancelled)

159. (Original)The product of claim 156 wherein the fiber density is less than about 3 ounces per square yard (100 grams per square meter).

160. (Cancelled)

161. (Original)The product of claim 156 wherein the film has a nominal thickness of less than about 0.003 inch (0.08 millimeter).

162-163. (Cancelled)

164. (Original)The product of claim 156 wherein the film forms projections extending out of a general plane of the film at the holes, the projections bearing against fibers passing through the holes.

165. (Original)The product of claim 156 wherein the fibers have an average staple length less than about 6 inches (15 centimeters).

166-169. (Cancelled)

170. (Original)The product of claim 156 wherein the fibers have a nominal tenacity of at least 3.0 grams per denier.

171. (Original)The product of claim 156 wherein the fibers are of between about 2 and 10 denier.

172-174. (Cancelled)

175. (Original)The product of claim 156 wherein the film is pre-printed with graphics that remain visible from the second side of the carrier sheet after fusing.

176. (Original)The product of claim 156 wherein the second side of the carrier sheet is embossed to impart a desired pattern to the loops.

177. (Original)The product of claim 176 wherein the pattern comprises raised beds of loops surrounded by regions of crushed fibers.

178. (Original)The product of claim 156 wherein the carrier sheet, fibers and binder all consist essentially of a single recyclable base resin.

179. (Original)The product of claim 156 wherein the carrier sheet, fibers and binder all consist essentially of biodegradable materials.

180-181. (Cancelled)

182. (Original)The product of claim 156 wherein the loops extend between about 2 and 8 millimeters, measured from a first side of the sheet.

183. (Cancelled)

184. (Original)The product of claim 156 wherein loop extension distances and density of piercing holes are selected to provide a textured pattern to the loops.

185. (Original)The product of claim 156 wherein the carrier sheet defines piercing holes only in selected regions, with other regions of the carrier sheet not defining piercing holes, to form loops only in the selected regions.

186. (Original)The product of claim 185 having more fibers in the selected regions than in the other regions.

187. (Original)The product of claim 185 wherein the binder is disposed only in the selected regions of the carrier sheet.

188. (Original)The product of claim 156 wherein the binder comprises a second sheet of film.

189. (Original)The product of claim 188 wherein the binder is pre-printed with graphics that remain visible from the second side of the carrier sheet after fusing.

190-191. (Cancelled)

192. (Original)The product of claim 156 wherein the binder is fused to the film at weld points that are linked in a substantially interconnected pattern.

193-194. (Cancelled)

195. (Original)The product of claim 156 wherein the loop fastener product, including carrier sheet, fibers and fused binder, has an overall weight of less than about 15 ounces per square yard (500 grams per square meter).

196-197. (Cancelled)

198. (Original)The product of claim 156 wherein the fastener product, including carrier sheet, loops and fused binder, has an overall thickness of less than about 0.1 inch (2.5 millimeters).

199-200. (Cancelled)

201. (Original)The product of claim 156 wherein the fused binder and carrier sheet together form a base sheet of the fastener product from which the loops extend, the base sheet having an overall thickness of less than about 0.005 inch (0.13 millimeter).

202. (Cancelled)

203. (Original)The product of claim 156 wherein the carrier sheet comprises a stretchable resin film.

204. (Cancelled)

205. (Original)The product of claim 156 wherein the binder is in fused powder form.

206. (Original)The product of claim 156 wherein there are sufficient piercing holes in the film that the carrier sheet becomes distendable; and wherein the binder comprises a stretchable material, thereby forming a stretchable loop fastener product.

207. (Original)The product of claim 206 wherein the stretchable material comprises a stretchable resin film.

208. (Original)The product of claim 156 wherein the material of the carrier sheet forms generally discrete regions separated by cracks extending between the piercing holes.